REMARKS/ARGUMENTS

Reconsideration and continued examination of the above-identified application are respectfully requested.

The amendment to the claims is editorial in nature and/or better defines what applicants regard as the invention. Full support for the amendment can be found in the present application, including the claims and pages 2, 6, and 8. The amendment to the specification and Figures corrects typographical errors. Support for this correction can be found at page 17 and in the claims, e.g., claim 59, as originally filed. Accordingly, no questions of new matter should arise and entry of this amendment is respectfully requested.

In the Office Action, at page 2, the Examiner objects to claims 19, 24, 29, 54, 64, 73, 76, 79, 82, 85, and 88. The Examiner asserts that temperatures provided in the claims are at times in Fahrenheit and at other times in Celsius. The Examiner is requesting that one temperature unit be consistently used throughout the claims. For the following reasons, this objection is respectfully traversed.

At the request of the Examiner, the claims have been amended to be consistent. Accordingly, this objection should be withdrawn.

At the bottom of page 2 of the Office Action, the Examiner rejects claims 1-6, 8-11, 13, 71-73, and 89-90 under 35 U.S.C. §102(b) as being anticipated by Clark et al., "Influence of Transverse Rolling on the Microstructural and Textural Development of Pure Tantalum," or Friedman, "Grain Size Refinement in a Tantalum Ingot," (herein referred to as Clark and Friedman respectively). The Examiner asserts that Clark and Friedman both show extruded tantalum billet

having a substantially uniform grain size and makes reference to various pages and figures in each of these references. For the following reasons, this rejection is respectfully traversed.

Contrary to the Examiner's interpretation of Clark, Clark only provides grain information for an extruded tantalum part after it has been cold rolled and annealed. There is no information provided in Clark with respect to grain size or other properties right after it has been extruded. In other words, the subsequent steps set forth in Clark, including the cold rolling and annealing, would greatly affect the properties of the rolling bar. The Examiner's attention is further directed to Figure 3 of Clark as well as the description of the processing beginning at the bottom of page 2183 (second column) and continuing onto page 2184 (first column). Thus, the Examiner's comparison of Clark with the rejected claims would not be a fair comparison since the claims of the present application relate to an extruded billet whereas the properties of Clark relate to an extruded and then annealed and then cold rolled working as shown in Figure 3. For this reason alone, the rejection of Clark should be withdrawn.

With respect to Friedman, the Figures of Friedman do not show grain uniformity along the axis of the billet. Only transverse images are presented in Friedman so there is no information regarding the effectiveness of Friedman's process on breaking up the elongated grains aligned with the billet axis. Also, as recognized by the Examiner, Friedman relates to tantalum having purities of approximately 99.95% Ta and therefore does not teach or suggest billets having a higher purity, such as 99.99% or greater.

Finally, while Friedman shows an upset and extruded bar with different annealing times and various grain sizes, Friedman does not teach or suggest the uniformity of this grain size. In other

words, it appears Friedman only gives average grain sizes for the edge and center but does not describe the uniformity of these grain sizes throughout the extruded bar as set forth in the claimed invention. It would be an unfair assumption for one skilled in the art to say that the average grain sizes presented in Friedman would automatically be uniform throughout the extruded bar when it is clearly understood that average grain sizes could mean that the various grain sizes that make up this average could be not substantially uniform. Accordingly, for these reasons, this rejection should be withdrawn.

At the bottom of page 3 of the Office Action, the Examiner rejects claim 36 under 35 U.S.C. §102(b) as being anticipated by Japanese Patent JP 2000-104164 (hereinafter JP '164). The Examiner asserts that JP '164 shows niobium sputtering targets made of high grade niobium having substantially uniform grain size. For the following reasons, this rejection is respectfully traversed.

JP '164 relates to certain types of sputtering targets that contain a high level of tantalum. According to the English translation provided by the Examiner, the tantalum content is preferably 3,000 ppm Ta and it appears contents as low as 1,000 ppm Ta can be used. Either way, this would make the purity of the niobium still quite low since niobium having 1,000 ppm tantalum would amount to a purity of 99.90% which does not even take into account other impurities that are not mentioned in this reference, but which certainly would exist to some degree.

In addition, based on a review of the English version, there appears to be no reference to a niobium billet. There is mention of a thermite reduction followed by EB dissolution, and there is also mention that there is plastic working by forging and rolling of the ingot. However, there appears to be no mention of a billet. Accordingly, for these reasons, this rejection should be

withdrawn.

At page 4 of the Office Action, the Examiner rejects claims 18-35, 74-79, and 91 under 35 U.S.C. §103(a) as being unpatentable over Clark in view of Friedman et al. (U.S. Patent No. 5,482,672). The Examiner relies on Clark in the same manner as described above in the earlier rejection. The Examiner acknowledges that Clark does not teach particular extrusion conditions. The Examiner then relies on Friedman to assert that this reference shows the extrusion of tantalum and niobium ingots and various temperatures of extrusion. The Examiner believes that one skilled in the art would be motivated to combine these references. For the following reasons, this rejection is respectfully traversed.

The comments set forth above with respect to Clark apply equally here. As stated above, Clark does not teach or suggest the properties of the billet or extruded billet but only shows properties once the rolling bar which has been extruded is subsequently annealed and then rolled in two different directions as shown in Figure 3 as well as the description of the processing procedure.

In addition, Friedman et al. (U.S. Patent No. 5,482,672) relates to a process for extruding tantalum or niobium which is a powder metallurgy product. In all of the embodiments set forth in Friedman et al., the process and the product relates to first cold isostatically pressing powdered metal to form a billet which is then placed in a metal container and subsequently processed. While the Examiner at page 5 of the Office Action asserts that Friedman teaches extrusion of tantalum and niobium billets and refers to column 19-20 and 41-44, this appears to be incorrect since Friedman et al. only has columns 1-8. In addition, the applicants could not see a disclosure in Friedman et al. that relates to tantalum or niobium ingots. Accordingly, clarification on the part of the Examiner is

respectfully requested.

Since Friedman et al. relates to powder metallurgy products and Clark relates to ingot derived products, one skilled in the art would not readily combine these two references together since they relate to different technologies. In addition, since the present application relates to billets which are ingot derived, Friedman et al. would not be relevant. While Friedman et al. is not combinable with Clark for the reasons set forth above, even if combined, the references still do not teach or suggest the claimed invention since, as stated above, Clark fails to teach or suggest a tantalum billet having uniform grain sizes as earlier mentioned. Friedman et al. does not overcome these deficiencies. Accordingly, for these reasons, the rejection should be withdrawn.

At page 6 of the Office Action, the Examiner rejects claims 7, 12, 14, 16, and 17 under 35 U.S.C. §103(a) as being unpatentable over Clark in view of International Application Publication No. WO 87/07650 (WO '650). The Examiner relies on Clark in the same manner as described above in earlier rejections. The Examiner acknowledges that Clark does not mention the purity of the metal material. The Examiner relies on WO '650 to assert that various purities of sputtering targets in resisted film layers are described in WO '650 and that it would be obvious to use this material in the process of Clark. For the following reasons, this rejection is respectfully traversed.

The differences between Clark and the claimed invention as described above apply equally here. As mentioned, Clark et al. does not teach or suggest the claimed invention. Clark et al. simply does not provide sufficient information to make such a conclusion, especially since the data in Clark et al. does not relate to a billet or extruded billet. In addition, the Examiner asserts that one skilled in the art could easily combine WO '650 with Clark. However, WO '650 relates to a very

high purity tantalum material and does not teach or suggest extruding billet from this metal. Also, for the Examiner to simply assert that this material can easily be extruded and obtain the various properties set forth in the claimed invention is an argument based strictly on hindsight. As the Examiner should know, various purities of tantalum can greatly affect the outcome with respect to grain size and the uniformity of that grain size. The substitution proposed by the Examiner would not be as easy as proposed by the Examiner. As stated, the WO '650 relates to very high purity tantalum where Clark relates to certain ingots which do not state any purity levels.

Thus, for the reasons set forth in the earlier rejection and for the reasons stated herein, this rejection should be withdrawn.

At page 7 of the Office Action, the Examiner then rejects claim 15 under 35 U.S.C. §103(a) as being unpatentable over Clark in view of Rerat (U.S. Patent No. 4,149,876). The Examiner relies on Clark in the same manner as set forth in the earlier rejections. The Examiner admits that Clark does not teach the use of a capacitor can. The Examiner then relies on Rerat to assert that tantalum and niobium are known materials for forming capacitor components including capacitor cans. Thus, the Examiner believes that the teachings can be combined to reject claim 15. For the following reasons, this rejection is respectfully traversed.

As stated above, Clark does not teach or suggest purity levels for the tantalum. Furthermore, the other comments set forth above with respect to Clark apply equally here. In addition, Rerat does not overcome these deficiencies since Rerat does not teach or suggest various purity levels. In addition, it is respectfully pointed out that Rerat relates to a metal powder such as tantalum or niobium powders and does not relate to ingot derived billet material. Thus, one skilled

in the art would consider Rerat quite different from Clark. In fact, throughout Rerat, the powder derived from the sodium reduction is maintained in powder form and is never shown to be melted into an ingot. Accordingly, the teachings of Rerat would not be combinable with Clark. Accordingly, for these reasons, the rejection should be withdrawn.

At the bottom of page 7 of the Office Action, the Examiner then rejects claims 37-41, 43-46, 48-49, 51-70, 80-88, and 92-94 under 35 U.S.C. §103(a) as being unpatentable over Japanese Patent Document JP 2000-104164 in view of Friedman (U.S. Patent No. 5,482,672). Essentially, the Examiner relies on each of these references in the same manner as described earlier. The Examiner believes that the two references are combinable. For the following reasons, this rejection is respectfully traversed.

As stated above, Friedman relates to powder metallurgy products whereas the Japanese reference relates to ingot derived materials. Thus, the two references are not combinable and would not teach or suggest the claimed invention. Furthermore, the deficiencies of the Japanese reference with respect to purity levels and the failure to teach or suggest billets would equally apply here. Accordingly, for these reasons, this rejection should be withdrawn.

At the top of page 10 of the Office Action, the Examiner then rejects claims 42 and 47 under 35 U.S.C. §103(a) as being unpatentable over Japanese Patent Document JP 2000-104164 in view of Friedman (U.S. Patent No. 5,482,672) in further view of Japanese Patent JP 362104180 (JP '180). The Examiner relies on JP '164 and Friedman as set forth above in earlier rejections. The Examiner further asserts that JP '180 teaches super high purity niobium sputtering targets having a purity greater than 99.99%. The Examiner believes it would be obvious to combine these

references together to reject these claims. For the following reasons, this rejection is respectfully traversed.

As stated above, Friedman relates to powder metallurgy product whereas JP '164 relates to ingot derived niobium material. In addition, JP '164 relates to low purity niobium which has high levels of tantalum which would be contrary to the high purity niobium sputtering targets set forth in JP '180. In fact, JP '164 specifically states that the tantalum is desirable and thus the teachings of JP '180 and JP '164 are quite different from each other and one would not be able to combine these references since the purity levels and the desire to have tantalum are quite different when each reference is compared. Thus, since the teachings are not combinable for various reasons, and in view of the fact of the differences set forth above in earlier rejections, this rejection should be withdrawn.

At page 11 of the Office Action, the Examiner rejects claim 50 under 35 U.S.C. §103(a) as being unpatentable over Japanese Patent Document JP 2000-104164 in view of Friedman (U.S. Patent No. 5,482,672) in further view of Rerat. The Examiner relies on these references in the same manner as in earlier rejections. For the following reasons, this rejection is respectfully traversed.

As stated above, Friedman relates to powder metallurgy products while JP '164 relates to ingot derived products. Furthermore, Rerat relates to tantalum powders. Thus, each of the three references relate to three different technology areas and would not be combinable. Also, for the reasons set forth above in earlier rejections, these references will not teach or suggest the claimed invention. Accordingly, for these reasons, the rejection should be withdrawn.

U.S. Patent Application No. 10/042,549
Amendment dated August 28, 2003
Reply to Office Action of April 28, 2003

CONCLUSION

In view of the foregoing remarks, Applicants respectfully request the reconsideration of this application and the timely allowance of the pending claims.

If there are any other fees due in connection with the filing of this response, please charge the fees to Deposit Account No. 03-0060. If a fee is required for an extension of time under 37 C.F.R. § 1.136 not accounted for above, such extension is requested and should also be charged to said Deposit Account.

Respectfully submitted,

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MARKED-UP VERSION
Annotated Sheet Showing Changes.

PROCESS	SAMPLE LOCATION	1742°F ~~950°C~~ ANNEAL X 2 HOURS Average Grain Size (μm)	Grain Size Range	Recrystallize (Percent)
Commercial Process	Center			
Commercial Process	Edge			
9.5"Ø, Extrude 1800°~~C~~F	Center	46	<10-240	95
9.5"Ø, Extrude 1800°~~C~~F	Edge	40	<10-250	99
9.5"Ø, Extrude 1850°~~C~~F	Center	33	<10-240	80
9.5"Ø, Extrude 1850°~~C~~F	Edge	35	10-290	65
9.5"Ø, Extrude 1900°~~C~~F	Center	33	10-180	50
9.5"Ø, Extrude 1900°~~C~~F	Edge	35	<10-225	98
10.25"Ø, Extrude 1900°~~C~~F	Center	32	10-110	65
10.25"Ø, Extrude 1900°~~C~~F	Edge	28	<10-200	85

FIGURE 2(A)

PROCESS	1922°F ~~1050°C~~ ANNEAL X 2 HOURS Average Grain Size(μm)	Grain Size Range	Recrystallize (Percent)	2102°F ~~1150°C~~ ANNEAL X 2 HOURS Average Grain Size(μm)	Grain Size Range	Recrystallize (Percent)
Commercial Process	60	20-245	76			
Commercial Process	60	10-155	100			
9.5"Ø, Extrude 1800°~~C~~F	45	10-150	95	60	10-150	100
9.5"Ø, Extrude 1800°~~C~~F	35	10-135	100	75	10-200	100
9.5"Ø, Extrude 1850°~~C~~F	65	<10-110	100	75	10-110	100
9.5"Ø, Extrude 1850°~~C~~F	63	<10-110	100	62	10-145	100
9.5"Ø, Extrude 1900°~~C~~F	32	10-180	100	86	10-145	100
9.5"Ø, Extrude 1900°~~C~~F	32	<10-90	99	122	10-135	100
10.25"Ø, Extrude 1900°~~C~~F	35	10-80	99	56	10-135	100
10.25"Ø, Extrude 1900°~~C~~F	38	<10-110	100	70	10-160	100

FIGURE 2(B)